



205332

December 2, 1998

Ms. Sheri Bianchin
Remedial Project Manager
U.S. Environmental Protection Agency
Region V, SR-J6
77 West Jackson Boulevard
Chicago, IL 60604-3590

Re: ACS NPL Site
October 28, 1998 Compliance Sample
Status of Measures Taken

Dear Ms. Bianchin:

On November 19, 1998, Montgomery Watson notified you of an arsenic exceedance in the October 28, 1998 groundwater treatment plant discharge sample (Attachment A). Preliminary analytical results received on November 18, 1998 from the routine compliance sample collected on October 28, 1998 indicated that this sample contained arsenic at 170 µg/L, above the effluent NPDES limit of 50 µg/L. Montgomery Watson promptly shut the system down on November 18, 1998 and began investigating the source of the arsenic. This letter serves to inform your office of the results of the following investigations:

1. A portion of the effluent sample collected on October 28, 1998 was still available at the laboratory for re-analysis. Re-analyses yielded the same result of arsenic concentration at 170 µg/L in the system effluent on October 28, 1998 (Attachment B).
2. The following potential sources of arsenic were sampled and analyzed:
 - i. Groundwater samples were collected from Barrier Wall Extraction System (BWES) trenches 11, 12 and 13 (closest to the highest levels of Site soils contamination) on November 19, 1998 and analyzed for arsenic. Arsenic was below detection limits in these wells (Attachment C).
 - ii. A sample of the system filter press cake was collected on November 20, 1998 and analyzed for arsenic. Arsenic was detected at 8.07 mg/L in the Filter Press Cake (Attachment D).
3. We also contacted the Hammond Publicly Owned Treatment Works (POTW), the source of the activated sludge seed for the biological groundwater treatment study conducted on-site between September and November 1998. The POTW informed Montgomery Watson that arsenic would not be present in the biomass.

4. The 10,000 lb granular activated carbon (GAC) units were emptied and refilled with fresh carbon on October 23, 1998. Although not likely, it is possible that the fresh carbon, if regenerated, could contain some amount of arsenic. Montgomery Watson was informed by the GAC supplier that spent GAC from the ACS site is regenerated, refreshed with virgin GAC and returned back to the ACS site for use in the GAC units. Therefore, the potential for arsenic to accumulate in the spent GAC, sustain the regeneration process, be returned to the site and gradually leach out into the effluent is remote, especially considering the low adsorption potential of arsenic onto GAC (Patterson, 1985) (Attachment E).
5. Following removal of the biological pilot test apparatus and associated sludge, the system was operated for several hours on November 23, 1998, during which time an effluent sample was collected for arsenic analyses. Arsenic was detected at 15 µg/L, well below the effluent NPDES limit of 50 µg/L (Attachment F).

The results of these investigations show that the likely source of arsenic was the filter press cake. Because arsenic was detected in the filter press cake, Montgomery Watson believes that the source of the arsenic in the groundwater treatment plant effluent on October 28, 1998 was sludge from the clarifier. We believe an operational upset of the groundwater treatment plant during the biological groundwater treatment study resulted in sludge exiting the clarifier and spilling over into the sand filter and the downstream GAC units. The sludge-contaminated sand filter and GAC units were the likely source of the arsenic in the treatment plant effluent.

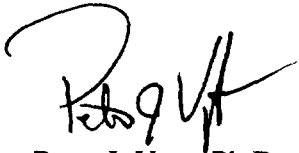
As a result of the above investigations, the following measures have been scheduled:

1. The groundwater treatment plant currently has raw and partially treated groundwater accumulated in several of the treatment process units since it was shut down on November 18, 1998. We will operate the treatment plant between 10 and 15 gpm in continuous recirculation mode on December 2 and 3, 1998. This will allow solids in the sand filter and the GAC cells to be flushed out and captured in the decanter (T-5) and/or the clarifier. The biological groundwater treatment pilot study is now complete and has been dismantled. This should eliminate the possibility of a similar sludge-related operational upset of the clarifier.
2. Montgomery Watson will operate the treatment plant in continuous mode beginning December 4, 1998. In accordance with our November 19, 1998 letter, we will sample the effluent weekly, for three weeks, and analyze the samples for arsenic.

We trust that this letter provides you adequate information regarding the October 28, 1998 exceedence. We will continue to update you on the analyses of the three weekly arsenic samples.

Please call me if you need further information or have any questions regarding this matter.
Your patience and cooperation in this matter is greatly appreciated.

Sincerely,



Peter J. Vagt, Ph.D., CPG
Project Manager

cc: Vince Epps
Steve Mrkvicka
Todd Lewis
Barbara Magel

Attachment A: Copy of the notification letter dated November 19, 1998 informing U.S. EPA of arsenic exceedence
Attachment B: Results of re-analyses of October 28, 1998 system effluent sample
Attachment C: Results of analysis of groundwater in BWES wells 11, 12 and 13 collected on November 19, 1998
Attachment D: Results of analysis of filter press cake collected on November 20, 1998
Attachment E: Excerpt from following Reference:
Patterson J.W., "Industrial Wastewater Treatment Technology," Butterworth Publishers, 2nd Ed., 13, 1985
Attachment F: Results of analysis of system effluent collected on November 23, 1998

SSND/TAB/PJV/snc
J:\1252\042\EPA-ltr\las_exceed_12_98 Response.doc



MONTGOMERY WATSON

November 19, 1998

Ms. Sheri Bianchin
Remedial Project Manager
U.S. Environmental Protection Agency
Region V, SR-J6
77 West Jackson Boulevard
Chicago, IL 60604-3590

Re: ACS NPL Site
October 28, 1998 Compliance Sample

Dear Ms. Bianchin:

A routine compliance sample was collected as scheduled from the ACS groundwater treatment system effluent on October 28, 1998. The preliminary analytical results, received on November 18, indicate that this sample exceeded the discharge limits for arsenic (sample result was 170 µg/L, limit is 50 µg/L). We have taken the following steps:

1. The system was shut down on November 18, until we verify the cause of the exceedence and implement a solution.
2. Contacted the laboratory to verify the results, and ask that they reanalyze the sample for arsenic, if sufficient volume remains.
3. We have been conducting a biological treatability pilot test at the Site for the past four months. It is possible that the activated sludge used in this study contained some level of arsenic. We have contacted the POTW that provided us the sludge, and will evaluate available data from that sludge. If no data are available, we will request a rush analysis for arsenic on the sludge.
4. The 10,000 lb granular activated carbon (GAC) units were emptied and refilled with fresh carbon on October 23, 1998. Although not likely, it is possible that the fresh carbon, if regenerated, contained some amount of arsenic. We have contacted the supplier to investigate this further.

As of November 18, 1998, we are removing the biological treatment pilot test apparatus, due to complications operating these units over the winter months. Therefore, if the sludge was the cause of the arsenic exceedence, we will have removed the source. When we start the system back up, we will collect an effluent sample, and analyze it for arsenic to confirm compliance.

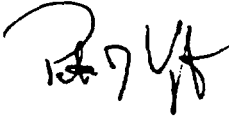
If the results from the confirmation sample indicate arsenic above the discharge limits, the treatment system will be shutdown and the individual treatment processes evaluated to

determine what is required to enhance the groundwater treatment. If the confirmation sample indicates that arsenic is below the discharge limit, the effluent will be sampled and analyzed for arsenic weekly for three more weeks to determine if exceedences recur. If they do, a confirmation sample will be collected and analyzed on a quick turn around for the exceeded analyte, and the process will continue until the treatment system is enhanced to the point of no exceedences.

Following the receipt of information from the above-mentioned sources, and evaluation of the cause of the arsenic exceedence, we will send a letter explaining the measures taken to alleviate the cause in the future.

Sincerely,

MONTGOMERY WATSON



Peter J. Vagt, Ph.D., CPG
Project Manager

cc: Vince Epps
Steve Mrkvicka
Todd Lewis
ACS Technical Committee

TAB/PJV/tab

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SAMPLE DESCRIPTION INFORMATION

OF
Montgomery Watson

Lab ID	Client ID	Matrix	Sampled		Received
			Date	Time	Date
135236-0001-SA	EFFLUENT 10-28-98	AQUEOUS	28 OCT 98	09:00	29 OCT 98

METALS
(Water)

Client Name: Montgomery Watson
Client ID: EFFLUENT 10-28-98
LAB ID: 135236-0001-SA
Matrix: AQUEOUS
Authorized: 18 NOV 98

Sampled: 29 OCT 98
Prepared: See Below

Received: 29 OCT 98
Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Prep Method	Test Method	Prepared Date	Analyzed Date
Arsenic	0.17		1.0	0.010	mg/L	TOTREC	6010B	18 NOV 98	18 NOV 98
Beryllium	ND		1.0	0.005	mg/L	TOTREC	6010B	18 NOV 98	18 NOV 98
Cadmium	ND		1.0	0.002	mg/L	TOTREC	6010B	18 NOV 98	18 NOV 98
Manganese	0.043		1.0	0.015	mg/L	TOTREC	6010B	18 NOV 98	18 NOV 98
Selenium	0.0096		1.0	0.005	mg/L	TOTREC	6010B	18 NOV 98	18 NOV 98
Thallium	ND		1.0	0.010	mg/L	TOTREC	6010B	18 NOV 98	18 NOV 98
Zinc	ND		1.0	0.020	mg/L	TOTREC	6010B	18 NOV 98	18 NOV 98

ND = Not Detected

QC LOT ASSIGNMENT REPORT - MS QC
Metals Analysis and Preparation

Laboratory Sample Number	QC Matrix	QC Category	QC Run Number (DCS)	QC Run Number (SCS/BLANK/LCS)	MS QC Run Number (SA,MS,SD,DU)
135236-0001-SA	AQUEOUS	QICP-A	18 NOV 98-Q	18 NOV 98-Q	

METHOD BLANK REPORT

Metals Analysis and Preparation

Project: 135236

Test: Q-ICPT-AR

Method 6010B - ICP Metals

Matrix: AQUEOUS

QC Run: 18 NOV 98-Q

Date Analyzed: 18 NOV 98

Analyte	Result	Units	Reporting Limit
Arsenic	ND	mg/L	0.010
Beryllium	ND	mg/L	0.0050
Cadmium	ND	mg/L	0.0020
Manganese	ND	mg/L	0.015
Selenium	ND	mg/L	0.0050
Thallium	0.0075 J	mg/L	0.010
Zinc	ND	mg/L	0.020

J = Result is detected below the reporting limit or is an estimated concentration.
ND = Not Detected

DUPLICATE CONTROL SAMPLE REPORT
Metals Analysis and Preparation
Project: 135236

Category: QICP-A Method 6010B - ICP Metals
Matrix: AQUEOUS
QC Lot: 18 NOV 98-Q
Concentration Units: mg/L

Date Analyzed: 18 NOV 98

Analyte	Spiked	Concentration		%Recovery		RPD	Acceptance	
		Measured					Limits	
		DCS1	DCS2	DCS1	DCS2		Recov.	RPD
Arsenic	2.00	1.97	1.98	98	99	0.4	85-115	20
Beryllium	0.0500	0.0515	0.0516	103	103	0.0	85-120	20
Cadmium	0.0500	0.0496	0.0499	99	100	0.6	80-120	20
Manganese	0.500	0.509	0.511	102	102	0.4	85-120	20
Selenium	2.00	2.03	2.04	102	102	0.2	85-125	20
Thallium	2.00	1.91	1.92	95	96	0.9	85-120	20
Zinc	0.500	0.520	0.520	104	104	0.0	85-120	20

Calculations are performed before rounding to avoid round-off errors in calculated result



ENVIRONMENTAL MONITORING AND TECHNOLOGIES, INC.

QUANTERRA

8100 North Austin Avenue
Morton Grove, Illinois 60053-3203

847-867-6666
FAX: 847-867-6735

TURNAROUND TIME:
☐ RUSH
 ___ day turnaround
☒ ROUTINE

Chain of Custody Record

Due Date: _____ COC #: **57776**

Company: **MONTGOMERY WATSON CONSTRUCTORS**
 Address: **410 S COLFAX ST**
GRIFFITH IN 46319
 Phone #: **(219) 924-4607** Fax #: **(219) 924-4561**
 P.O. #: **89** Proj. #: _____
 Client Contact: **LEE ORDSZ**
 Project ID / Location: **ACS**

Sample Type: Container Type:
 1. Water P - Plastic
 2. Soil G - Glass
 3. Sludge V - VOC
 4. Oil B - Bag
 5. Tissue O - Other
 Other: _____
 Preservative:
 1. None 3. HNO3
 2. H2SO4 4. NaOH

Analyses

VOC's
 SVOC's
 BOD
 METALS
 TSS/PH
 PCB

Sample I.D. (10 Characters ONLY)	Sample Type	Container			Sampling		Preser- vative	Lab I.D.											Comments
		Size	Type	No.	Date	Time													
1000M	G	3	10/28/98	9AM	100				X										
1000M	G	2							X										
1000M	P	1								X									
500M	P	1					3				X								
500M	P	1					1					X							
1000M	G	2					1						X						

EMT REQUIRES PRIOR NOTICE OF SAMPLES CONTAINING CYANIDE. EMT SAMPLE RETURN POLICY ON BACK.

Relinquished By: 	Date: 10-28-98 Time: 10:AM	Received By: 	Date: 10-29-98 Time: 10:30a	Witness:	<input checked="" type="checkbox"/> SAMPLE RECEIVED ON ICE <input type="checkbox"/> TEMPERATURE
Relinquished By:	Date: -- -- Time: :	Received For Lab By:	Date: -- -- Time: :		

SPECIAL INSTRUCTIONS:

Montgomery Watson (Indiana)

Region: 5

Date Sampled: 11/19

Priority: RUSH

Montgomery Watson (Indiana)

Report Date: 11/20/1998

Sample Received: 11/19/98

Description: Wastewater Grab - 13

Sample No.: 056346

Notes: 24 HR. RUSH

Analyte	Result	Units	Completed	Analyst	Method
Arsenic	<0.200	ppm	11/20/98	NATALIA	206.2 (20)
Barium	1.17	ppm	11/20/98	MATTHEW	200.7 (20)
Cadmium	0.770	ppm	11/20/98	MATTHEW	200.7 (20)
Chromium	0.11	ppm	11/20/98	MATTHEW	200.7 (20)
Lead	0.66	ppm	11/20/98	MATTHEW	200.7 (20)
Mercury	<u>0.0045</u> X	ppm	X	X	245.1 (20)
Selenium	<0.200	ppm	11/20/98	NATALIA	270.2 (20)
Silver	X	ppm	X	X	200.7 (20)

Note on tempcvd: Sample received on ice

(20) Analysis performed using "Methods for Chemical Analysis of Water and Wastes"

Reviewed:

Blair W. Watson

Date:

11-20-98

Montgomery Watson (Indiana)

Region: 5

Date Sampled: 11/19

Priority: RUSH

Montgomery Watson (Indiana)

Report Date: 11/20/1998

Sample Received: 11/19/98

Description: Wastewater Grab - 12

Sample No.: 056345

Notes: 24 HR. RUSH

Analyte	Result	Units	Completed	Analyst	Method
Arsenic	<0.200	ppm	11/20/98	NATALIA	206.2 (20)
Barium	0.52	ppm	11/20/98	MATTHEW	200.7 (20)
Cadmium	<0.020	ppm	11/20/98	MATTHEW	200.7 (20)
Chromium	<0.10	ppm	11/20/98	MATTHEW	200.7 (20)
Lead	<0.20	ppm	11/20/98	MATTHEW	200.7 (20)
Mercury	<u>1000³</u> <u>X</u>	ppm	X	X	245.1 (20)
Selenium	<0.200	ppm	11/20/98	NATALIA	270.2 (20)
Silver	<u>X</u>	ppm	X	X	200.7 (20)

Note on tempcvd: Sample received on ice

(20) Analysis performed using "Methods for Chemical Analysis of Water and Wastes"

Reviewed by:

Blair W. W.

Date:

11-20-98

Montgomery Watson (Indiana)

Region: 5

Date Sampled: 11/19

Priority: RUSH

Montgomery Watson (Indiana)

Report Date: 11/20/1998

Sample Received: 11/19/98

Description: Wastewater Grab - 11

Sample No.: 056344

Notes: 24 HR. RUSH

Analyte	Result	Units	Completed	Analyst	Method
Arsenic	<0.200	ppm	11/20/98	NATALIA	206.2 (20)
Barium	0.34	ppm	11/20/98	MATTHEW	200.7 (20)
Cadmium	<0.020	ppm	11/20/98	MATTHEW	200.7 (20)
Chromium	<0.10	ppm	11/20/98	MATTHEW	200.7 (20)
Lead	<0.20	ppm	11/20/98	MATTHEW	200.7 (20)
Mercury	<u>LO.003</u> <u>X</u>	ppm	X	X	245.1 (20)
Selenium	<0.200	ppm	11/20/98	NATALIA	270.2 (20)
Silver	<u>X</u>	ppm	X	X	200.7 (20)

Note on tempcvd: Sample received on ice

(20) Analysis performed using "Methods for Chemical Analysis of Water and Wastes"

Reviewed By:

Date:

11-20-98



TURNAROUND TIME:
☒ RUSH
1 day turnaround
☐ ROUTINE

Chain of Custody Record

8100 North Austin Avenue
Morton Grove, Illinois 60053-3203

847-967-6666
FAX: 847-967-6735

Due Date: _____ - _____ - _____ COC #: 57783

Company: MONTGOMERY WATSON
Address: 410 S Colfax ST
GRIFFITH IN 46319
Phone # (219) 924-4607 Fax # (219) 924-4561
PO #: Proj #
Client Contact LEE OROSZ
Project ID / Location ACS

Sample Type: Container Type:

- | | |
|-----------|-------------|
| 1. Water | P - Plastic |
| 2. Soil | G - Glass |
| 3. Sludge | V - VOC |
| 4. Oil | B - Bag |
| 5. Tissue | O - Other |

Other :

Preservative:
1. None 3. HNO₃
2. H₂SO₄ 4. NaOH

Analyses

[illegible]

EMT REQUIRES PRIOR NOTICE OF SAMPLES CONTAINING CYANIDE. EMT SAMPLE RETURN POLICY ON BACK.

Relinquished By <i>[Signature]</i>	Date: 11-20-98 Time: 7:45	Received By: <i>[Signature]</i>	Date: 11-20-98 Time: 2:20 PM	Witness:	<input checked="" type="checkbox"/> SAMPLE RECEIVED ON ICE
Relinquished By	Date: -- -- Time:	Received For Lab By: <i>[Signature]</i>	Date: 11-20-98 Time: 5:50		<input type="checkbox"/> TEMPERATURE

SPECIAL INSTRUCTIONS:

Montgomery Watson (Indiana)

Region: 5

Date Sampled: 11/20

Priority: RUSH

Montgomery Watson (Indiana)

Report Date: 11/23/1998

Sample Received: 11/20/98

Description: Sludge Grab - FILTER CAKE

Sample No.: 056423

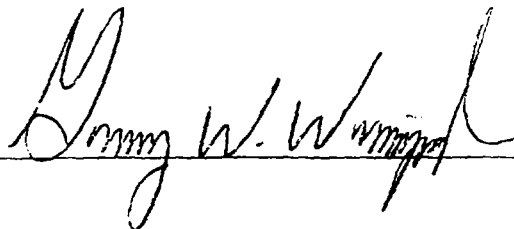
Notes: RUSH 1 DAY TAT

Analyte	Result	Units	Completed	Analyst	Method
Arsenic	8.07	ppm	11/23/98	NATALIA	7060A(6)

Note on tempcvd: Sample received on ice

(6) Methods performed according to SW-846 "Test Methods for Evaluating Solid Waste"

Reviewed By:



Date:

11.24.98

Industrial Wastewater Treatment Technology, Second Edition

James W. Patterson

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Wastewaters

ng/l)	
Soluble	Reference
—	14
10.1	11
132	11
6.0–22.0	12
—	15
—	13
0.1–0.68	9
0.05–5.70	10
0.15–19.0	10
—	15
—	10
0.001–51	10
0.04–0.92	16
—	17
—	18
—	19
—	6
—	21
—	6
—	20
0.76	22
—	20
—	20
—	20
—	20

acid production plant was Sulfur dioxide used in the and the high arsenic ore. Table 2.1 summarizes of arsenic.

ed in raw municipal water r treatment industry. Many i contain excessive arsenic in up to 2 mg/l arsenic, are n the area called *blackfoot* s of the southwest United [27].

TREATMENT TECHNOLOGY

Limited information is available on current arsenic-wastewater treatment processes and removals obtained. Much of the literature describing treatment of arsenic wastes is 30 years or more old. More up-to-date information is available on the removal of arsenic from drinking water, and in fact the methods for treatment of both drinking water and industrial wastes are similar. The treatment methods and arsenic removal efficiencies discussed in detail below are summarized in Table 2.2.

Common treatment methods for arsenic include lime or sulfide precipitation or coprecipitation with iron or aluminum hydroxide, plus adsorption onto coagulant floc, with enmeshment of particulate arsenic. This second process is typical of the traditional coagulation process used in the water treatment

Table 2.2 Summary of Arsenic Treatment Methods and Removals Achieved

Treatment	Initial Arsenic (mg/l)	Final Arsenic (mg/l)	% Removal	Reference
Precipitation with sulfide	—	0.05	—	28
	132.0	26.4	80	11
	—	—	99	20
Ferric sulfide filter bed	0.8	0.05	94	25
Precipitation with lime	0.2	0.03	85	29
	0.5	0.03	95	11
	—	0.01	73	9
Precipitation with lime plus iron	—	0.05	—	4
	—	—	69–99	20
			85–92	
Coprecipitation with alum	0.35	0.003–0.005	85–92	30
	430	0.023	99+	18
Coprecipitation with ferric sulfate	0.31–0.35	0.003–0.006	98–99	30
	25	5	80	31
Coprecipitation with ferric chloride	3.0	0.005	98	32
	0.58–0.90	0.0–0.13	81–100	26
Coprecipitation with ferric salt	—	0.6	—	33
	362.0	15–20	94–96	14
Charcoal bed filtration	0.2	0.06	70	29
Activated carbon adsorption	0.5	0.3	40	11
	—	—	21–99	20
Ion exchange	2.3	0.52	77	18

SAMPLE DESCRIPTION INFORMATION
for
Montgomery Watson

Lab ID	Client ID	Matrix	Sampled		Received
			Date	Time	Date
135361-0001-SA	EFFLUENT	AQUEOUS	23 NOV 98	16:00	24 NOV 98

METALS
(Water)

Client Name: Montgomery Watson
Client ID: EFFLUENT
LAB ID: 135361-0001-SA
Matrix: AQUEOUS
Authorized: 24 NOV 98

Sampled: 23 NOV 98
Prepared: See Below

Received: 24 NOV 98
Analyzed: See Below

Parameter	Result	Qual	DIL	RL	Units	Method	Prep Date	Analyzed Date
Arsenic	0.015		1.0	0.010	mg/L	6010B	24 NOV 98	24 NOV 98

QC LOT ASSIGNMENT REPORT - MS QC
Metals Analysis and Preparation

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK/LCS)	MS QC Run Number (SA,MS,SD,DU)
135361-0001-SA	AQUEOUS	QICP-A		24 NOV 98-BX	24 NOV 98-BA

METHOD BLANK REPORT

Metals Analysis and Preparation

Project: 135361

Test: Q-ICPT-AR

Method 6010B - ICP Metals

Matrix: AQUEOUS

QC Run: 24 NOV 98-BX

Date Analyzed: 24 NOV 98

Analyte

Result

Units

Reporting
Limit

Arsenic

ND

mg/L

0.010

ND = Not Detected

LABORATORY CONTROL SAMPLE REPORT
Metals Analysis and Preparation
Project: 135361

Category: QICP-A Method 6010B - ICP Metals

Matrix: AQUEOUS

Date Analyzed: 24 NOV 98

QC Run: 24 NOV 98-BX

Concentration Units: mg/L

Analyte	Concentration		Accuracy(%)	
	Spiked	Measured	LCS	Limits
Arsenic	2.00	1.86	93	85-115

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE QC REPORT
 Metals Analysis and Preparation
 Project: 135361

Category: QICP-A Method 6010B - ICP Metals
 Matrix: AQUEOUS
 Sample: 135361-0001
 MS Run: 24 NOV 98-BA
 Units: mg/L

Analyte	Sample Result	Concentration		Amount Spiked MS/MSD	Recovery		RPD	Acceptance Limit	
		MS Result	MSD Result		MS	MSD		Recov.	RPD
Arsenic	0.0151	1.95	1.92	2.00	97	95	1.4	85-115	20

Calculations are performed before rounding to avoid round-off errors in calculated results.

Table 5-1
Effluent Discharge Criteria

Parameter	Onsite Influent Conc. (µg/L)	Offsite Influent Conc. (µg/L)	Combined Influent Conc. (µg/L)	Effluent Discharge Criteria (µg/L)
CA	15.8	ND	7.9	NA
Acetone	35.9	ND	17.95	109
Isophorone	0.2	ND	0.1	50
THF	2,351.20	ND	1,175.6	25
Benzene	10.2	ND	5.1	5
4 Methyl-2-pentanone	40.6	ND	20.3	15
Toluene	93.8	ND	46.9	50
Chlorobenzene	2.8	ND	1.4	50
Ethylbenzene	20.3	ND	10.15	700
Xylenes	31.3	ND	15.65	10
1,1 DCA	0.03	ND	0.015	90
1,2 DCA	2.5	ND	1.25	5
4-Methylphenol	2.8	ND	1.4	296
BEP	5.2	ND	2.6	343.8
1,3-DCB	1	ND	0.5	NA
2-Methylphenol	0.8	ND	0.4	420
Iron	7,062.7	10.7	3,536.7	1,000
Arsenic	12.7	1.4	7.05	BG (1-5)
di-n-butylphthalate	0.8	ND	0.4	12.7
VC	ND	3.6	1.8	2
TCE	ND	8.7	4.35	5
c-1,2 DCE	ND	0.2	0.1	70
Manganese	ND	13.3	6.65	NA
Total flow = 832 gpm (wells option) or 560 gpm (drains option)				
BG = Background concentration				

TABLE - 2A

Program File Name : MASTER [Calculations With No Hydraulic/Stream Survey Data and Induced Mixing]

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Discharger Name Dana Corp. Mearstown
 Receiving Stream Whitewater River
 NPDES Permit NO IND#####

13:52:04

DISCHARGE STREAM FLOWs and WATER QUALITY DATA

Discharge Flow	0.5000 mgd	0.78 cfs
Q7,10 receiving stream (Outfall)	0.00 cfs	0.00 mgd
Q7,10 receiving stream (Drinking Water Intake)	cfs	0.00 mgd
Q50 receiving stream (Outfall)	0.00 cfs	0.00 mgd
Q50 receiving stream (Drinking Water Intake)	0.00 cfs	0.00 mgd
Discharge-Induced Mixing Dilution Ratio (S)	0.0000	
Hardness (50th percentile) (Summer)	276	
Stream pH (50th percentile)	7.9	

	Summer	Winter
Stream Temperature (75th percentile) in CG	25.0	8.08
Stream pH (75th percentile)	8.20	7.90
Discharge-Induced Mixing	No	
Drinking Water Intake Downstream	No	
Coldwater Fish Present	No	
Ohio River or Interstate Wabash River Discharge	No	

Dilution Flows**Aquatic Toxicity**

Chronic	
Chemical-Specific (1/2 Q7,10 Upstream Flow)	0.00 mgd
Whole Effluent Toxicity (1/4 Q7,10 Flow)	0.00 mgd
Acute (0 unless Discharge Induced Mixing present)	0.00 mgd

Human Health - Aquatic

Toxicity (1/2 Q7,10 Upstream Flow)	0.00 mgd
Carcinogenicity (1/4 Q50 Upstream Flow)	0.00 mgd

Human Health - Drinking Water

Toxicity (Q7,10 at Drinking Water Intake)	0.00 mgd
Carcinogenicity (Q50 at Drinking Water Intake)	0.0 mgd

Total Flow (Dilution Flow + Discharge Flow)

Aquatic Toxicity	
Chronic	
Chemical-Specific	0.00 mgd
Whole Effluent Toxicity	0.00 mgd
Acute	0.00 mgd

Human Health - Aquatic

Toxicity	0.00 mgd
Carcinogenicity	0.00 mgd

Human Health - Drinking Water

Toxicity	0.00 mgd
Carcinogenicity	0.0 mgd

TABLE - 2A

Upstream			CAS Number	Parameters	I	II	III		Water Quality-based Effluent Limits		Limit of		Ave. Value	Max. Compl. Limit
Source	II	III			Human Health Organisms ug/l	Human Health Water ug/l	Aquatic Chronic ug/l	Toxicity Acute (FAV) ug/l	Average ug/l	Maximum ug/l	Source	Detection ug/l	Quant.	ug/l
1	1	1	0.0	PCB's	0.00079 C	0.00079 C	0.014		0.00066	0.00130	I	NA	NA	NA
			0.0	12674112 PCB-1016					NA	NA	NA	0.1 I	0.32	NA
			0.0	11104282 PCB-1221					NA	NA	NA	0.1 I	0.32	NA
			0.0	11141166 PCB-1232					NA	NA	NA	0.1 I	0.32	NA
			0.0	63489219 PCB-1242					NA	NA	NA	0.1 I	0.32	NA
			0.0	12672296 PCB-1248					NA	NA	NA	0.1 I	0.32	NA
			0.0	11097691 PCB-1254					NA	NA	NA	0.1 I	0.32	NA
			0.0	11099925 PCB-1268					NA	NA	NA	0.1 I	0.32	NA

T = derived from threshold toxicity

C = derived from non-threshold cancer risk

DC = derived from drinking water standards, based on carcinogenic effects

DT = derived from drinking water standards, based on toxic effects

- 1) Indiana Water Quality Standards
- 2) IWQS Equations (327 IAC 2-1-8.2 & 8.3) with testing data from EPA
- 3) National Drinking Water Regulations
- 4) EPA Gold Book
- 5) Aquatic acute/chronic criteria from CH2M Hill report for Fort Wayne Reduction
- 6) EPA Criteria
- 7) IWQS Equations (327 IAC 2-1-8.2 & 8.3) with testing data from literature
- 8) Site-specific calculation using procedures from 327 IAC 2-1-8.2 & 8.3
- 9) Draft EPA Criteria

- A) EPA Method 601-GC/Hal.
- B) EPA Method 602-GC/PID
- C) EPA Method 603-GC/FID
- D) EPA Method 604-GC/FID (Table 1)
- E) EPA Method 604-GC/ECD (Table 2)
- F) EPA Method 605-HPLC
- G) EPA Method 606-GC/ECD
- H) EPA Method 607-GC/N-PD
- I) EPA Method 608-GC/ECD
- J) EPA Method 608-GC/FID
- K) EPA Method 610-HPLC
- L) EPA Method 611-GC/Hal.
- M) EPA Method 612-GC/ECD
- N) EPA Method 613-GC/MS
- O) EPA Method 622-GC/Flame Photometric
- P) EPA Method 624-GC/MS
- Q) EPA Method 625-GC/MS
- R) EPA Method 1613-HRGC/HRMS
- S) EPA Method 1624-GC/MS (Isotope)
- T) EPA Method 1625-GC/MS (Isotope)
- U) EPA Method 200.7 (ICP)
- V) EPA Methods Manual - Atomic Absorption, Furnace Technique
- W) EPA Methods Manual - Atomic Absorption, Direct Aspiration
- X) EPA Methods Manual
- Y) M Detection Limit

TABLE -

AMERICAN CHEMICAL SERVICES, INC., GRIFFITH, LAKE COUNTY, INDIANA
FINAL NPDES NUMBERS FOR DISCHARGE TO NO FLOW WETLANDS

Table 7: ROD	Respondent proposal	NPDES FINAL #	RATIONALE
benzene	29 ug/l	5 ug/l	MCL
vinyl chloride	---	2 ug/l	MCL
PCB	1.0 ug/l	0.00056 ug/l	MCL
bis (2-chloroethyl) ether	533 ug/l	9.6 ug/l	IWQEL
arsenic	0.19 mg/l	0.12 ug/l	IWQEL
tetrachlorethene	24 ug/l	5.0 ug/l	MCL
methylene chloride	498 ug/l	100 ug/l	BAT/PA
chloromethane	---		
beryllium	---	0.83 ug/l	IWQEL
trichloroethene	189 ug/l	5 ug/l	MCL
bis (2-ethylhexyl) phthalate	49 ug/l	6 ug/l	MCL
cyclic ketones	xxx		
pentachlorophenol	3.83 ug/l	1 ug/l	MCL
1,4 dichlorobenzene	---		
isophorone	267 ug/l	50.0 ug/l	BAT/PA
2-butanone	7,156 ug/l	210 ug/l	BAT/PA
4-methyl 2-pentanone	1,160 ug/l	15 ug/l	BAT/PA
noncyclic acids	xxx		
acetone	---	109 ug/l	BAT/PA
branched alkanes	xxx		
ethyl benzene	34 ug/l		*
thallium	---	2 ug/l	MCL
dimethyl ethyl benzene	xxx		
1,2 dichloroethene (cis)	---	30 ug/l	BAT/PA
manganese	---		
4-methyl phenol	34 ug/l		*
1,1 dichloroethane	---		

MCL: Maximum Contaminant Level

IWQEL: Indiana Water Quality Effluent Limits

BAT/PA: Best Available Treatment established by Pennsylvania DER

***: Accept Montgomery Watson value provided within their proposal**